Remarks

Claims 1-29 remain pending in this application after entry of this paper. Claims 2-13 and 15-29 are withdrawn from consideration. Original claims 1 and 14 were rejected. Applicant has amended claim 1 to more particularly point out the invention. Claim 1 has been amended to point out that the buffer assembly guides the wave front toward the fluid.

The Examiner rejected original claim 1 under 35 U.S.C. 102(e) as being anticipated by Hsu et al. (U.S. Patent No. 6,643,211). Hsu relates to acoustic logging tools, and to structures and methods for damping tool waves. As explained by Hsu, acoustic logging tools are used for performing acoustic investigations of subsurface geological formations traversed by a bore hole. An acoustic logging tool typically includes an acoustic transmitter and an acoustic receiver axially spaced from the transmitter. By design, acoustic energy is allowed to propagate through the surrounding formation before being received at the receiver. Further, it is desired that the minimum amount of energy from the transmitter be transferred to the tool body and the maximum amount of energy be radiated into the bore hole and the formation. Hsu further notes that acoustic energy may travel along multiple paths to reach the receiver, the part of the acoustic energy that propagates through the formation and fluid in the well is the energy that provides useful information, and the part of the acoustic energy that propagates through the tool body generally provides no useful information.

The acoustic energy that propagates along the tool body is the tool wave. The acoustic energy that propagates through the formation is the formation wave. Column 1, line 44 - column 2, line 15.

It is important to recognize that in these acoustic logging tools, by design, the acoustic energy is allowed to propagate through the surrounding formation before being received at the receiver so that the formation wave can be captured. Accordingly, the goal of various design features of these acoustic logging tools is to reduce the tool wave effects by

employing structures to damp tool waves. Hsu's invention involves structures for damping tool waves. Various structures are proposed and shown in the drawings.

The Examiner makes reference to Figure 9 and column 9, lines 47-65. Hsu does describe attenuators 905 that may be heat-shrink fit to the tool body 901. However, it is important to note that these attenuators 905 are designed for damping tool waves such that the acoustic logging tool allows the acoustic energy to propagate through the surrounding formation before being received at the receiver, yet reduces the effects of tool waves.

In contrast, claim 1 recites an acoustic transducer for measuring a property of a fluid. The acoustic transducer comprises an acoustic pulse generator, and a buffer assembly. The buffer assembly is between the pulse generator and the fluid. The buffer assembly is composed of a core and a sleeve shrink fitted over the core to form a cladding. The cladding reduces dispersion of the acoustic pulses traveling through the core. The buffer assembly guides the wave front toward the fluid.

Claim 1 specifically recites an acoustic transducer involving a buffer assembly composed of a core and a sleeve shrink fitted over the core to form a cladding. This cladding reduces dispersion of the acoustic pulses and the buffer assembly guides the wave front toward the fluid. Hsu fails to anticipate these claimed features. Hsu teaches damping tool waves and allowing acoustic energy to propagate through surrounding formation, and teaches away from the concept of reducing dispersion of acoustic pulses and guiding the wave front (through the buffer) toward the fluid. The claimed invention is far different from Hsu in that the claimed buffer assembly reduces dispersion and guides the wave front toward the fluid as opposed to encouraging propagation through surrounding formations and damping tool waves. For these reasons, claim 1 is believed to be patentable.

Original claim 1 was also rejected under 35 U.S.C. 103(a) as being unpatentable over Stiffler et al. (U.S. Patent No. 5,708,209) in view of Groh et al. (EP 352676). Stiffler describes an apparatus and method for ultrasonic particle detection in molten metal. The

Examiner states that Stiffler does not specify a shrink fitted sleeve over the core. The Examiner relies on the secondary reference as suggesting modification of Stiffler to achieve the claimed invention.

There is no motivation to combine these references to achieve the claimed invention. Stiffler does describe an acoustic transducer including a buffer rod. A closer examination of Stiffler reveals that in Figure 1, reference number 38 notes a channel about the buffer rod that allows compressed air to flow through the channel. Column 6, lines 20-22. Accordingly, it seems that it would not be desirable to shrink fit sleeve 36 because of the need for channel 38.

Regarding Groh, this publication does mention holding together optical wave guides by a shrink fitted sleeve. However, this publication relates to a thermometer including one or more optical wave guides or fiber bundles. There is no suggestion that any of these teachings would be appropriate for use in an acoustic transducer. Even so, Applicant has given reasons why it would be undesirable to make such modifications to Stiffler. Further, Groh relates to a thermometer and optical wave guides and appears to be outside of the field of Applicant's endeavor and unrelated to the particular problem addressed by Applicant, making Groh non-analogous art. For these additional reasons, claim 1 is also believed to be patentable.

Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Stiffler in view of Groh, and further in view of Jen (Patent No. 5,241,287). Claim 14 is a dependent claim and is believed to be patentable for reasons given above with respect to claim 1.

Claims 1 and 14 are believed to be in condition for allowance and such action is respectfully requested.

Respectfully submitted,

JAMES A. HILL

By 
Jeremy J. Curcuri
Reg. No. 42,454
Attorney for Applicant

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BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351